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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,065	12/22/2004	Hans Willem Van Kesteren	NL 021083	7326

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EXAMINER	
HEYI, HENOK G	

ART UNIT	PAPER NUMBER
2609	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/519,065	VAN KESTEREN, HANS WILLEM	
	Examiner	Art Unit	
	Henok G. Heyi	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-12 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-12 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on 22 December 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirokane et al. US 6,150,038 (Hirokane hereinafter).

Re claim 1, a magneto-optical recording medium (a magneto-optical recording medium, a reproducing apparatus and a reproducing method, col 3 line 30) comprising a magneto-optical recording layer and an auxiliary magnetic layer (stack and form a perpendicular magnetized film such as an auxiliary recording layer, col 11 line 16-20), wherein a recorded magnetic domain of said magneto-optical recording layer is magnetically transferred to said auxiliary magnetic layer upon irradiation with a reproducing radiation (an optical beam irradiating means of a reproducing apparatus emits a light beam 4 on the first magnetic layer 1 so that the second magnetic layer 2 forms an heated area whose temperature exceeds the Curie temperature, col 6 line 6-10 and the auxiliary recording layer, which has a higher Curie temperature than the recording layer, is stacked so as to increase the magnetrostatic coupling between the auxiliary recording layer and the recording layer, col 11 line 40-44), whereby a larger

magnetic domain than said recording magnetic domain of said magneto-optical recording layer can be read back from said auxiliary magnetic layer at the time of reproduction by virtue of the magnetic characteristics of said auxiliary magnetic layer, and wherein said auxiliary magnetic layer comprises a stack including at least two sub-layers which are anti-ferromagnetically coupled through a non-magnetic metallic layer (magnetostatically coupled, col 15 line 10 and see fig. 7 and fig. 11).

Re claim 2, a recording medium according to claim 1, wherein said sub-layers both consist of a rare-earth transition-metal material (the first magnetic layer is made from a rare earth metal and the second magnetic layer, col 9 line 32-50).

Re claim 3, a recording medium according to claim 1, wherein said sub-layers have substantially the same composition (the alloy of rare earth metal transition metals, which are used for the first magnetic layer 1, the second magnetic layer 2, col 11 line 1-2).

Re claim 4, a recording medium according to claim 1, wherein said rare-earth transition-metal material comprises GdFeCo (GdHRFeCo where HR is a heavy rare earth metal, col 9 line 32-38).

Re claim 5, a recording medium according to claim 1, wherein said rare-earth transition-metal material comprises GdFe (made of materials selected from: GdFe and GdFeD or GdFeCoD (D is made of one or more elements selected from Y, Ti, V, Cr, Pd,

Cu, Si, and Al), and GdHRFe, GdHRFeCo, or GdHRFeCoD (HR is a heavy rare earth metal, and is made of one or more elements selected from Tb, Dy, Ho, and Er, and D is made of one or more elements selected from Y, Ti, V, Cr, Pd, Cu, Si, and Al), and GdLRFe, GdLRFeCo, or GdLRFeCoD(LR is a light rare earth metal, and is made of one or more elements selected from Ce, Pr, Nd, and Sm, and D is made of one or more elements selected from Y, Ti, V, Cr, Pd, Cu, Si, and Al) col 9 line 32-45).

Re claim 10, a recording medium according to claim 1, wherein the storage layer and the auxiliary layer are coupled over a non-magnetic interlayer (magnetostatically coupled, col 15 line 10 and see fig. 7 and fig. 11).

Re claim 11, a recording medium according to claim 1, wherein the auxiliary layer and the intermediate layer are coupled at least in a temperature range below the readout temperature by exchange interaction (when the first magnetic layer, the second magnetic layer, and the third magnetic layer respectively have Curie temperatures of Tc1, Tc2, and Tc3, a condition of $Tc2<Tc1<Tc3$ is satisfied, col 33 line 5-10).

Re claim 12, A method of manufacturing a magneto-optical recording medium (a magneto-optical recording medium, a reproducing apparatus and a reproducing method, col 3 line 30) comprising a magneto-optical recording layer and an auxiliary magnetic layer (stack and form a perpendicular magnetized film such as an auxiliary recording layer, col 11 line 16-20), wherein a recorded magnetic domain of said

magneto-optical recording layer is magnetically transferred to said auxiliary magnetic layer upon irradiation with a reproducing radiation (an optical beam irradiating means of a reproducing apparatus emits a light beam 4 on the first magnetic layer 1 so that the second magnetic layer 2 forms an heated area whose temperature exceeds the Curie temperature, col 6 line 6-10 and the auxiliary recording layer, which has a higher Curie temperature than the recording layer, is stacked so as to increase the magnetrostatic coupling between the auxiliary recording layer and the recording layer, col 11 line 40-44), whereby a larger magnetic domain than said recording magnetic domain can be read back from said auxiliary magnetic layer at the time of reproduction by virtue of the magnetic characteristics of said auxiliary magnetic layer, said method comprising the step of forming said auxiliary magnetic layer by generating at least two sub-layers which are anti-ferromagnetically coupled through a non-magnetic metallic layer (magnetostatically coupled, col 15 line 10 and see fig. 7 and fig. 11).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirokane et al. US 6,150,038 (Hirokane hereinafter) as applied to claim 1 above, and further in view of Kesteren et al US 5,756,202 (Kesteren hereinafter).

Re claim 6, Hirokane teaches a recording medium according to claim 1 but he does not teach about the said non-magnetic metallic layer is an Ru layer. However, Kesteren teaches that the antiferromagnetic coupling material is selected from the group formed by V, Cr, Mn, Cu, Nb, Mo, Ru, Rh, Ta, W, Re, Os, Ir, and mixtures thereof (see col 4 line 20-30). Therefore, the combined teaching of Kesteren and Hirokane would have rendered obvious to select Ru for a non-magnetic metallic layer for the specific thickness of the layer needed.

Re claim 7, Kesteren teaches a recording medium according to claim 6, wherein said Ru layer has a thickness ranging from 0.5 nm to 1.5 nm (layer has a thickness in the range 0.5 nm-1.2 nm, col 4 line 38-40).

Re claim 8, Kesteren teaches a recording medium according to claim 6, wherein said Ru layer has a thickness of about 0.8 nm which is very close 0.9nm (col 4 line 45-46).

Re claim 9, Kesteren teaches a recording medium according to any one of claim 1, wherein the Kerr rotation or ellipticity of the recording stack (the relative Kerr rotation contributions from parts P.sub.1 and P.sub.2, col 12 line 8) has a larger magnitude for the antiparallel than for the parallel orientation of the sub layer magnetizations (A third magnetic switching field H.sub.s3, for switching magnetizations in part P.sub.1 out of parallel orientation with respect to corresponding magnetizations in part P.sub.2 and into anti-parallel orientation with respect thereto, is larger than a fourth magnetic switching field H.sub.s4, for switching magnetizations in part P.sub.2 out of parallel orientation with respect to corresponding magnetizations in part P.sub.1 and into anti-parallel orientation with respect thereto, col 6 line 32-42).

Conclusion

The referenced citations made in the rejection(s) above are intended to exemplify areas in the prior art document(s) in which the examiner believed are the most relevant to the claimed subject matter. However, it is incumbent upon the applicant to analyze the prior art document(s) in its/their entirety since other areas of the document(s) may be relied upon at a later time to substantiate examiner's rationale of record. A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). However, "the prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed...." In re Fulton, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Henok G. Heyi whose telephone number is (571) 272-1816. The examiner can normally be reached on Monday to Friday 7:30 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vu Le can be reached on (571) 272-7332. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HGH

VU LE
SUPERVISORY PATENT EXAMINER